

1 I. TITLE: "CONTAINER AND COUPLING SYSTEM FOR
2 TRANSFERRING GRANULAR AND OTHER MATERIALS"
3

4 II. BACKGROUND OF THE INVENTION
5

6 1. Field of the Invention.
7

8 The present invention relates to a container and coupling system for
9 transferring granular and other materials.
10

11 2. Other Related Applications.
12

13 The present application is a national stage patent application of the
14 PCT/CR2002/000004, with international filing date of June 6, 2002, which
15 is hereby incorporated by reference.
16

17 2. Description of the Related Art.
18

19 Several designs for container and coupler system have been designed
20 in the past. None of them, however, includes the features claimed herein.
21

22 Applicant believes that one of related references corresponds to U.S.
23 patent No. 5,967,383 issued to the inventor in the present application,
24 Edgar Hidalgo, on October 19, 1999 for a container and coupler assembly
25 for transferring granulated material. The patented coupling system
26 includes a connecting threaded assembly that is frictionally and snugly
27 mounted inside the neck of the container. The upper wall of the
28 connecting threaded assembly includes at least one off-centered opening.
29 The patented invention includes a cap assembly that is rotatably and

1 coaxially mounted over the connecting threaded assembly and the former
2 also includes at least one off-centered opening that is selectively made to
3 coincide with the off-centered opening of the connecting threaded
4 assembly. A spring is used to bias these two assemblies to make the
5 respective off-centered openings not to coincide. A coupling ring assembly
6 is firmly mounted inside the neck of a pump dispenser. The cap assembly
7 engages the coupling ring assembly. A gasket member is used to achieve a
8 hermetic sealing engagement between the dispenser and the container. A
9 user can dispense granulated material from the container to a dispenser by
10 achieving a hermetically sealed engagement without coming in contact
11 with the material. However, it differs from the present invention because
12 the patented invention required substantial modifications of the second
13 container, which is typically an applicator used for fumigation, which has
14 been obviated with the use of the flexible conduit, nozzle and cap
15 assemblies of the present invention. Additionally, the use of a base that
16 cooperates with a hanging cable facilitates the transportation of the first
17 container in the field.

18
19 Applicant believes that another related reference corresponds to
20 Costa Rica patent No. 2519 issued to the inventor of the present
21 application, Edgar Hidalgo, in 1999 for a coupling system for pump and
22 box for loading and unloading of granulated agrochemicals and others.
23 This patented invention includes a valve, with two concentric cylindrical
24 members and a collar-shape member. The valve is mounted to a container
25 and the collar-shape member to another container. The collar-shape
26 member receives and secures the valve and couples both containers so
27 material can be transferred from one container to the other using the
28 gravity force. However, there is no disclosure here of the nozzle, flexible

1 conduit and cap assemblies, as mentioned above, nor of a base that
2 cooperates with a cable for its support and transportation.

3
4 Applicant believes that other of related references corresponds to
5 Costa Rica patent No. 2552 issued to the inventor of the present
6 application, Edgar Hidalgo, in 1997 for an improvement to the above
7 mentioned Costa Rica patent No. 2519. This patent incorporates to the
8 parent patent a automatic closing mechanism, several packing assemblies
9 to get an impermeable and hermetic closing of the system, a cover to
10 protect the valve and several minor modifications to improve the system
11 operation. However, this invention does not teach the use of a flexible
12 conduit, nozzle, cap assemblies and the use of a base that cooperates with a
13 hanging cable facilitates the transportation of the first container in the field,
14 as in the present invention discloses.

15
16 Applicant believes that other of related references corresponds to
17 Costa Rica utility model No. MU115 issued to the inventor of the present
18 application, Edgar Hidalgo, in 1997 for a container for transferring,
19 transporting and storage of granulated agrochemicals and others. This
20 container is used with the system describes in the above mentioned Costa
21 Rica patent numbers 2519 and 2552. This is ergonomic designed container
22 to facilitate its handling while it provide and impermeable and hermetic
23 closing system. However, the patented invention differs from the present
24 invention for the same reasons discussed above.

25
26 Other patents describing the closest subject matter provide for a
27 number of more or less complicated features that fail to solve the problem

1 in an efficient and economical way. None of these patents suggest the
2 novel features of the present invention.

3 4 **III. SUMMARY OF THE INVENTION**

5
6 It is one of the main objects of the present invention to provide a
7 container and coupling system for safely storing and transporting granular
8 materials.

9
10 It is another object of this invention to provide a container and
11 coupling system that permit the safe transfer of granular materials to other
12 containers.

13
14 It is still another object of the present invention to provide a spherical
15 container and coupling system that is secure, hermetic and easy to
16 manipulate.

17
18 It is yet another object of this invention to provide such a device that
19 is inexpensive to manufacture and maintain while retaining its
20 effectiveness.

21
22 Further objects of the invention will be brought out in the following
23 part of the specification, wherein detailed description is for the purpose of
24 fully disclosing the invention without placing limitations thereon.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Figure 1 represents a front elevational view of the preferred embodiment for the spherical container, object of the present application, with a partial cross section showing its inner upper configuration. Also the nozzle, the flexible conduit, the regulating valve, the cap and the second container are represented.

Figure 2 shows a front elevational view of the spherical container with a partial cross section showing the interior of the lower portion of the spherical container.

Figures 3A; 3B; 3C and 3D illustrate isometric views of four embodiments for the cap assembly removably mounted to the second container.

Figures 4A; 4B; 4C and 4D show isometric representations of alternated embodiments for the regulator valve.

Figure 5 shows a front elevational view of four stacked up spherical

containers with their respective valves and including partial cross-sections to show the interlocking engagement.

Figure 6 is an enlarged cross-section elevational view showing the outlet nozzle, the cover, the O-ring and the plug.

Figure 7 is a cross-section elevational view showing the flexible conduit mounted to the nozzle at one end and the other end connected to the regulating valve and the cap.

V. DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, where the present invention is generally referred to with numeral **10**, it can be observed that it basically includes spherical container assembly **1**, nozzle assembly **2**, flexible conduit assembly **3**, regulating valve assembly **4**, cap assembly **5** and container assembly **6**, as seen in figure 1.

Spherical container assembly **1** is used to store, transport and transfer granulated products to other containers **6** or vice versa. As best seen in figure 2, spherical container assembly **1** is a compact and hermetic container to provide safe and easy manipulation of its contents. The spherical configuration for container **1** is preferred, but also a conical or other suitable shape that permits the ready evacuation of the granular material can be used. Container assembly **1** has circular base **14** for stable upright support. Circular base **14** extends with a frustroconical shape and

1 includes openings 13 for receiving therethrough cable 100. Step walls 41;
2 42; 43 and 44 are coaxially and annularly disposed inwardly from the
3 center of base 14. Spherical container assembly 1 includes threaded neck 9.
4 As seen in figure 2, bottom portion 19 includes circular base section 14 with
5 through openings 13, internal horizontal sections 42 and 43 and inward
6 vertical sections 41 and 44. Horizontal sections 42 and 43 and vertical
7 sections 41 and 44 define internal cavity that cooperates with the shape of
8 upper section 27 of container 1 and cap 15 when they are vertically stacked.
9

10 Two handle members 11 (only one is shown in figure 2) are
11 cooperatively disposed on the outer surface of spherical container
12 assembly 1, in one of the preferred embodiments. Depressions 40 are
13 formed around handle members 11, undulations 40 and bottom portion 19.
14 Handle members 11 diagonally opposed with respect to each other.
15 Handle members 11 have, in the preferred embodiment, a mushroom
16 shape and they are mounted to depressions 40 formed on the outer wall of
17 container 1. The concave shape of depressions 40 permits the user to
18 achieve a good grip with his/her hand.
19

20 As seen in figure 2, outlet nozzle assembly 2 includes transferring
21 valve 36 and cover member 15. Transferring valve 36 has internal thread 2'
22 that mates with threaded neck 9 to removably mount to each other.
23 Transferring valve 36 also includes peripheral skirt 2'' integrally built on
24 top wall 2''' ,which includes central opening 49. Top wall 2''' has an
25 underside with circular groove for receiving gasket 8 that coacts with the
26 rim of threaded neck 9 to achieve a hermetic enclosure. Peripheral end 113
27 includes peripheral notch 45 that snugly receives O-ring 16 to further
28 ensure the hermeticity and isolation of the granular material contained

1 within container assembly 1. As best seen in figure 6, cover member 15 is
2 rigid and snugly fits over peripheral end 113 that, along with plug member
3 50, keeps the contents of spherical container 1 hermetically sealed.

4
5 As best seen in figure 6, outlet nozzle assembly 2 has neck 7, end 36,
6 internal threaded portion 19 and peripheral external cutout 12 for
7 mounting any additional sealing element. Outlet nozzle assembly 2 also
8 includes O-ring receiving peripheral notch 45 and through opening 10
9 adjacent to the lower portion of peripheral external cutout 12.

10
11 As seen in figure 6, gasket 8 is mounted on the top portion of
12 threaded neck 9 to provide a hermetic sealing effect when outlet nozzle
13 assembly 2 is cooperatively coupled to threaded neck 9. Plug 50 is
14 removably mounted to opening 49 to ensure that the product is kept inside
15 container assembly 1 when container 1 is stored or being moved. Finally,
16 cover member 15 is removably mounted to outlet nozzle assembly 2. O-
17 ring 16, mounted to O-ring receiving peripheral notch 45, keeps cover
18 member 15 in place.

19
20 As best seen in figure 7, flexible conduit 3 has two ends. One of the
21 ends is removably connected to nozzle assembly 2 and the other end
22 houses regulating valve assembly 3, which includes an inlet receiving the
23 granular material entering from the end connected to nozzle assembly 2.

24
25 As seen in figures 4A; 4B and 4C, regulating valve assembly 4
26 includes cylinder 4a with bottom wall 36 that has through openings 31 and
27 central opening 39, as best seen in figure 4A. Cylinder 4a also includes
28 slots 38 on its lateral wall 28. Second cylinder 4b with bottom wall 32 has

1 through openings 33 and inwardly and perpendicularly extending central
2 cylindrical protrusion 35 with slot 35' at its top end, as best seen in figure
3 4B. Second cylinder 4b also has outwardly extending flanged edge 29
4 extending outwardly from the rim of lateral wall 54 and protruding
5 annular wall 30 around the central portion of its lateral wall 54. Second
6 cylinder 4b has tubular member 34 with central through opening 46. Once
7 inserted cylinder 4a inside second cylinder 4b, as shown in figure 4C, pin
8 50 is passed through opening 46 and slot 38 to limit the movement of
9 cylinder 4a inside second cylinder 4b. Also, one end of spring member 52
10 is inserted in slot 35' and the other end is engaged to pin 37. Through
11 openings 31 and 33 can be made to coincide by aligning them, which is
12 achieved by the application of a force of a predetermined magnitude to
13 overcome spring member 52 that keeps them out of alignment and
14 consequently in closed position, as best seen in figure 4C.

15
16 Figures 3A; 3B; 3C and 3D show four embodiments for cap assembly
17 5 removably mounted to container assembly 6. Embodiment 5A is
18 represented in figure 3A and it has flat top wall 21 with central opening 26.
19 Embodiment 5B is represented in figure 3B and it has convex top wall 18
20 with central opening 26. Embodiment 5C is represented in figure 3C and it
21 has concave top wall 23 with eccentric opening 26 and arched handle 24;
22 and the embodiment 5D represented in figure 3D has concave top wall 23
23 with central opening 26 and interrupted arched handle 19. Embodiments
24 5A; 5B; 5C and 5D also have plugs 20 to removably close openings 26. L-
25 shape slots 22 adjacent to the top of openings 26 receives tubular member
26 34, as explained below.

1 As best shown in figure 7, to assemble container and coupling system 10
2 for transferring granular and other materials, a user inserts neck 7 of
3 transferring valve 36 in one of the ends of flexible conduit assembly 3. The
4 other end of flexible conduit assembly 3 is mounted to regulating valve
5 assembly 4 until top with flanged edge 29. The other side of regulating
6 valve assembly 4 is mounted inside opening 26 of cap assembly 5. Tubular
7 member 34 is cooperatively inserted in L-shape slots 22 to lock regulating
8 valve assembly with cap assembly 5.

9
10 The foregoing description conveys the best understanding of the
11 objectives and advantages of the present invention. Different embodiments
12 may be made of the inventive concept of this invention. It is to be
13 understood that all matter disclosed herein is to be interpreted merely as
14 illustrative, and not in a limiting sense.